



STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development Standard Energy Code Proposal Form

May 2018

Log No. 21-GP1-126 TAG Revision

06/04/21

Code being amended: ☒ Commercial Provisions ☐ Residential Provisions

Code Section # C405.2

Brief Description:

Moves LLLC control function to standalone section, rewords a few things, fixes section reference, and adds requirement for high-end trim.

Proposed code change text: (Copy the existing text from the Integrated Draft, linked above, and then use underline for new text and ~~strikeout~~ for text to be deleted.)

C405.2 Lighting controls. Lighting systems shall be provided with controls that comply with one of the following:

1. Lighting controls as specified in Sections C405.2.1 through C405.2.9.
- ~~2.1.2. Luminaire level lighting controls (LLLC) as specified in Section C405.2.10. and lighting controls as specified in Sections C405.2.1, C405.2.3 and C405.2.6. The LLLC luminaire shall be independently configured to:~~
 - ~~3.1. Monitor occupant activity to brighten or dim lighting when occupied or unoccupied, respectively.~~
 - ~~4.1. Monitor ambient light, both electric and daylight, and brighten or dim artificial light to maintain desired light level.~~
 - ~~5.1. For each control strategy, configuration and re-configuration of performance parameters including: bright and dim set points, timeouts, dimming fade rates, sensor sensitivity adjustments, and wireless zoning configuration.~~

C405.2.10 Luminaire level lighting controls. Where luminaire level lighting controls are required they shall be configured to provide the controls or equivalent control function and lighting controls as specified in Sections C405.2.1, C405.2.3 and C405.2.6. In addition, each The LLLC luminaire shall be independently configured to:

- 1.1. Monitor occupant activity to brighten or dim lighting when occupied or unoccupied, respectively.
- 1.2. Monitor ambient light, both electric and daylight, and brighten or dim artificial light to maintain desired light level.
- 1.3. For each control strategy, Allow configuration and re-configuration of performance parameters for each control strategy including: bright and dim set points, timeouts, dimming fade rates, sensor sensitivity adjustments, and wireless zoning configuration.

C405.2.10.1 High-end trim. The maximum bright setpoint of each LLLC luminaire shall be adjusted to deliver the required target/design light with the least amount of power.

Purpose of code change:

Achieve energy savings from advanced lighting control

Your amendment must meet one of the following criteria. Select at least one:

- | | |
|--|---|
| <input type="checkbox"/> Addresses a critical life/safety need. | <input type="checkbox"/> Consistency with state or federal regulations. |
| <input checked="" type="checkbox"/> The amendment clarifies the intent or application of the code. | <input type="checkbox"/> Addresses a unique character of the state. |
| <input checked="" type="checkbox"/> Addresses a specific state policy or statute.
(Note that energy conservation is a state policy) | <input type="checkbox"/> Corrects errors and omissions. |

Check the building types that would be impacted by your code change:

- | | | |
|--|---|---|
| <input type="checkbox"/> Single family/duplex/townhome | <input type="checkbox"/> Multi-family 4 + stories | <input checked="" type="checkbox"/> Institutional |
| <input type="checkbox"/> Multi-family 1 – 3 stories | <input checked="" type="checkbox"/> Commercial / Retail | <input type="checkbox"/> Industrial |

Your name	Mike Kennedy	Email address	mikekennedy@energysims.com
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Your organization	Mike Kennedy, Inc	Phone number	3603010098
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Other contact name [Louis Starr](#)

Instructions: Send this form as an email attachment, along with any other documentation available, to: sbcc@des.wa.gov. For further information, call the State Building Code Council at 360-407-9278.

Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

The requirement to conduct high-end trim in this proposal will increase installation costs to the owners and deliver significant energy savings. Since this is an alternate path that generally costs more than standard controls the impact will be no cost change and no savings. For those utilizing this path, high-end trim is most likely being done. Still a cost benefit for the new requirement is completed here.

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost [Analysis tool](#) and [Instructions](#); use these [Inputs](#). [Webinars on the tool can be found Here and Here](#))

\$0/square foot (For residential projects, also provide \$0/ dwelling unit)

Show calculations here, and list sources for costs/savings, or attach backup data pages

Task tuning was estimated at \$0.03/sf to \$0.06/sf by the Minnesota Department of Commerce. The high end of this estimate is used. Assuming 80ft² per fixture high-end trim/task tuning costs \$4.80 per fixture plus tax - \$5.28.

Adjusting lighting levels in commercial buildings: Energy savings from institutional tuning. 2015. Minnesota Department of Commerce, Division of Energy Resources.

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

12.5 kWh/year per fixture

Savings have been found to be ~ 25% when comparing building with network lighting controls with LLC which reflects the savings from having individual controls on each fixture. High-end trim (task tuning) has been shown to save 27% in the same study. These are not 100% additive but do combine to some extent. Assuming a 40watt fixture, 2500 hours/ year operation, and 25% savings yields a savings of 25 kWh/year. Assuming trim savings in new construction are drastically less results in 12.5 kWh/year

Energy Savings from Networked Lighting Control Systems With and Without Luminaire Level Lighting Controls. Table 2. October 6, 2020. Northwest Energy Efficiency Alliance.

OFM Calculator Summary

Life Cycle Cost Analysis		BEST	
Alternative	Baseline	Alt. 1	Alt. 2
Energy Use Intensity (kBtu/sq.ft)	#DIV/0!	#DIV/0!	#DIV/0!
1st Construction Costs	\$ -	\$ 5	\$ -
PV of Capital Costs	\$ -	\$ 13	\$ -
PV of Maintenance Costs	\$ -	\$ -	\$ -
PV of Utility Costs	\$ 334	\$ 292	\$ 334
Total Life Cycle Cost (LCC)	\$ 334	\$ 305	\$ 334
Net Present Savings (NPS)	N/A	\$ 29	\$ -

Societal LCC takes into consideration the social cost of carbon dioxide emissions caused by operational energy consumption

(GHG) Social Life Cycle Cost		BEST	
GHG Impact from Utility Consumption	Baseline	Alt. 1	Alt. 2
Tons of CO2e over Study Period	2	2	2
% CO2e Reduction vs. Baseline	N/A	13%	0%
Present Social Cost of Carbon (SCC)	\$ 131	\$ 114	\$ 131
Total LCC with SCC	\$ 464	\$ 419	\$ 464
NPS with SCC	N/A	\$ 45	\$ -

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

No additional time.

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.